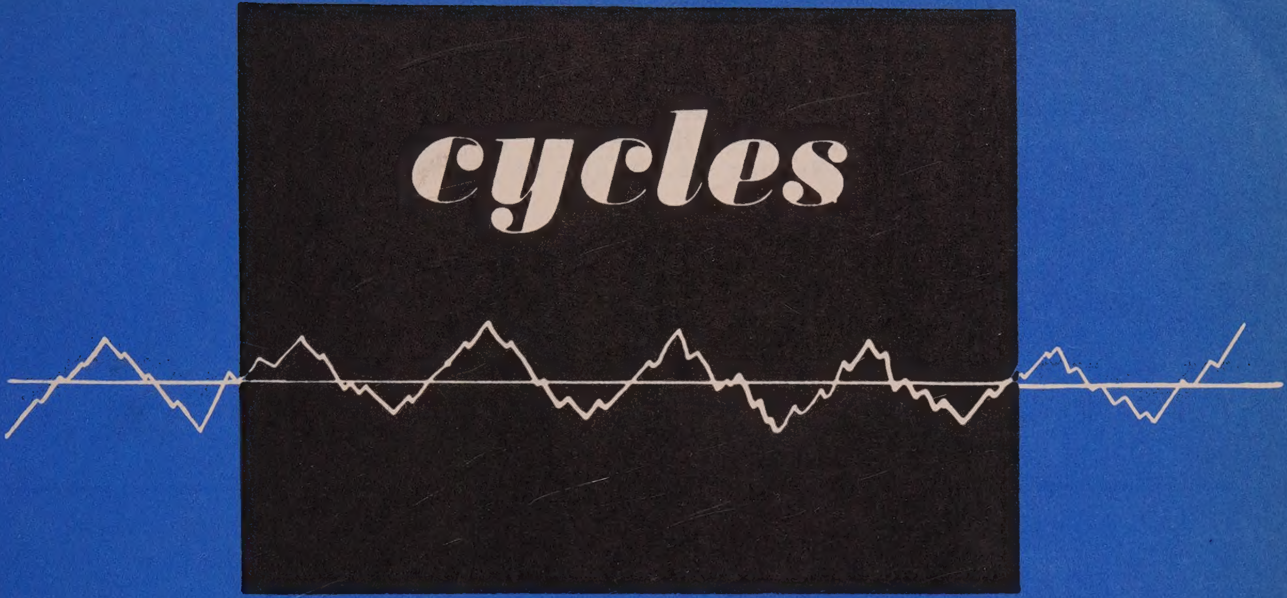
cycles



August – September 1955

FOUNDATION FOR THE STUDY OF CYCLES
New York, New York

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cycles

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Study of Cycles

VOLUME VI NUMBER 7 AUGUST — SEPTEMBER 1955

The Director's Letter

Dear Member:

Strange as it may seem, businessmen—even presidents of companies—have emotions! The concept of supermen, controlling their companies in cool detachment, is not always correct.

I would not go so far as to say that businessmen's emotions *control* their actions, but I do think that in many instances their actions are influenced or at least colored by the state of their feelings.

Even if their *actions* are not colored by their emotions, it is my experience that their peace of mind is disturbed when a boom ends unexpectedly or when they find themselves in the midst of an unexpected decline. I think that it is the *unexpectedness* rather than the actual decline that causes most of the distress.

The attention now being given to cycles does much to improve this situation. Businessmen are coming to realize emotionally as well as intellectually that every boom contains within itself the elements of an ensuing decline; every decline contains the seeds of a future boom.

Businessmen Need Exact Information

However helpful this concept may be, it is not enough. Businessmen need to know *exactly* when the turning points will come.

I wish I could say that a knowledge of cycles provides all the answers. Perhaps someday it will, but at the present time the most that can be said for a knowledge of cycles is that it may be of help.

A 30-Month Pattern

For example, for a number of times now the peaks of U. S. A. business activity, as measured by the Federal Reserve Board Index of Industrial Production, have come at intervals about 30 months apart. Also there is a 30-month cycle well established in other series of figures. Putting these two facts together we get a hint that *possibly* this pattern will continue, and that the peak of the coming move *may* come about 30 months after the last peak, which came in June of 1953.

As early as the fall of 1953 a knowledge of this 30-month tendency gave us the suggestion that the decline *might* end as early as the third quarter of 1954. And, when in fact the decline did end then, it gave us two additional suggestions: First, that the advance which followed might last through 1955; second, that it might level off or decline late in 1955 or early in 1956.

There is nothing scientific about these conjectures. The 30-month cycle in general business has not always dominated. It has not repeated itself enough times to give any assurance that it is anything more than coincidence. It will surely fail sometime. The failure may come this time or several cycles hence. No one knows. The most that can be said is that it is an interesting possibility and that since this tendency in these figures has been observed, it has worked out satisfactorily.

To keep you from taking these comments too seriously I cannot resist the temptation to poke a little sly fun at myself and tell you the story of the man who fell off the roof of a 30-story building. "Everything is good so far," he was heard to say as he passed a window on the 17th floor!

The Modified Geisinger Indicator

Another straw in the wind is the Modified Geisinger Indicator (published on pages 222 and 223 of this issue). In the past this Indicator has generally turned about 8 months in advance of corresponding turns in general business. As you can see by turning to the inside book cover, the Modified Geisinger Indicator reached a peak in January and went down moderately in February and March.

If there were an *exact* correspondence between this Indicator and general business we could predict a peak of the present boom in September of this year. Unfortunately, there is no such direct relationship. On several occasions in the past the Geisinger Indicator has fallen off moderately without any corresponding decline of business. Until the Indicator falls off more substantially I would say there is not too much to worry about. Still, it is a straw in the wind on the side of caution at a time when optimism for 1956 seems general.

Change in Rate of Growth also Significant

Another statistical technique used in forecasting the future depends upon the fact that the Federal Reserve Board Index of Industrial Production changes its direction *gradually*. That is to say, the *rate* of advance generally slackens off several months before the actual crest. If you will refer to the chart on the inside back cover showing the Federal Reserve Board Index of Industrial Production you will see that this is what happened prior to the peak of 1953, the peak of 1951, and the peak of 1948.

The preliminary July figure of this Index comes to my desk as I write. It is 140. Confirmation of this figure by the final values will give the first evidence that the rate of growth of this index has started to slack off. It will be a third straw in the wind suggesting caution.

Conclusion

The turndown of the Modified Geisinger Indicator of Industrial Production, the slackening of the rate of growth of the F. R. B. Index itself, and a superficial observation of the cycles involved, combine to suggest that the present advance may be spending itself and that in 1956 the index of production may level out or turn down.

Cordially yours,

Edward R. Dewey

Director

Research

THE 6-YEAR AND THE 8½-YEAR CYCLES

IN

GENERAL ELECTRIC SALES

PART ONE: THE 6-YEAR CYCLE

THE sales of the General Electric Company have been characterized by a 6-year cycle for as far back as I have been able to get figures (1899).

The 6-year cycle in General Electric sales crests typically at 1900.8 and every 6 years thereafter. This puts the current crest ideally at 1954.8 (Oct.—Nov. 1954). Of course the actual crest of the present cycle or any other particular cycle is not likely to come at the exact ideal time. Crests (and troughs) almost always come a little early or a little late.

Typically the 6-year cycle in General Electric sales is 26.9% above trend at time of crest, 21.3% below trend at time of trough. This amounts to an overall move of 48 % of trend in three years or 16 % of trend a year. Ideally the cycle is symmetrical in shape. That is, it goes up for three years, down for three years.

Published figures of General Electric sales are not entirely homogeneous. Consolidated sales figures are given for 1935-1954; parent company sales 1899-1941. Moreover sales for 1909 are given for 11 months only and sales prior to 1909 are for years ending January 31st. For purposes of cycle study we need adjusted figures. These were obtained as follows:

Consolidated figures were used 1935 to date.

Figures prior to 1935 were increased by 32½% to make them as nearly as possible comparable to figures 1935 forward (Consolidated figures for 1935 were 132.5% of parent company figures for the same year).

Figures for 1909 were increased by 1/11.

Figures for 1908 and years prior are counted as if they were calendar years ending December 31 instead of fiscal years ending January 31.

A chart of the adjusted figures is shown as Curve A of Fig. 1.

Fig. 1 also shows a 7-year moving average trend (Curve B). Such a trend looses three years at each end of the series of figures.

Fig. 1 Curve C shows the percentages by which the actual sales are above or below trend. The timing of the typical 6-year cycle has been diagrammed by means of a broken line. (Curve D).

As you can see, the turning points in the departures or deviations from trend show the following variations from perfect timing (disregarding the fact that ideal turning points come a little after the middle of the year):

Highs:
1st cycle, (ideally 1906), one year late
2nd cycle, (ideally 1912), one year late

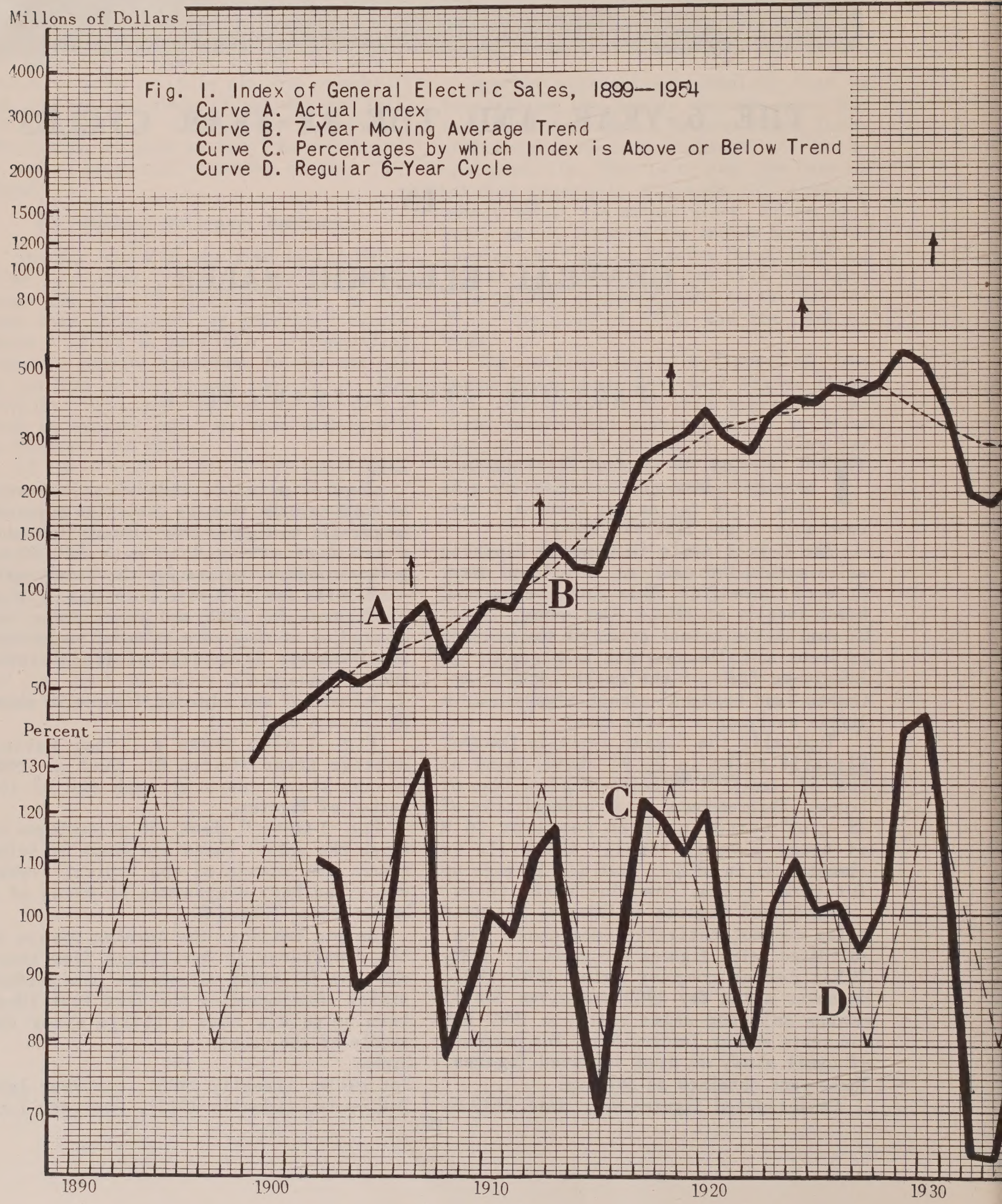
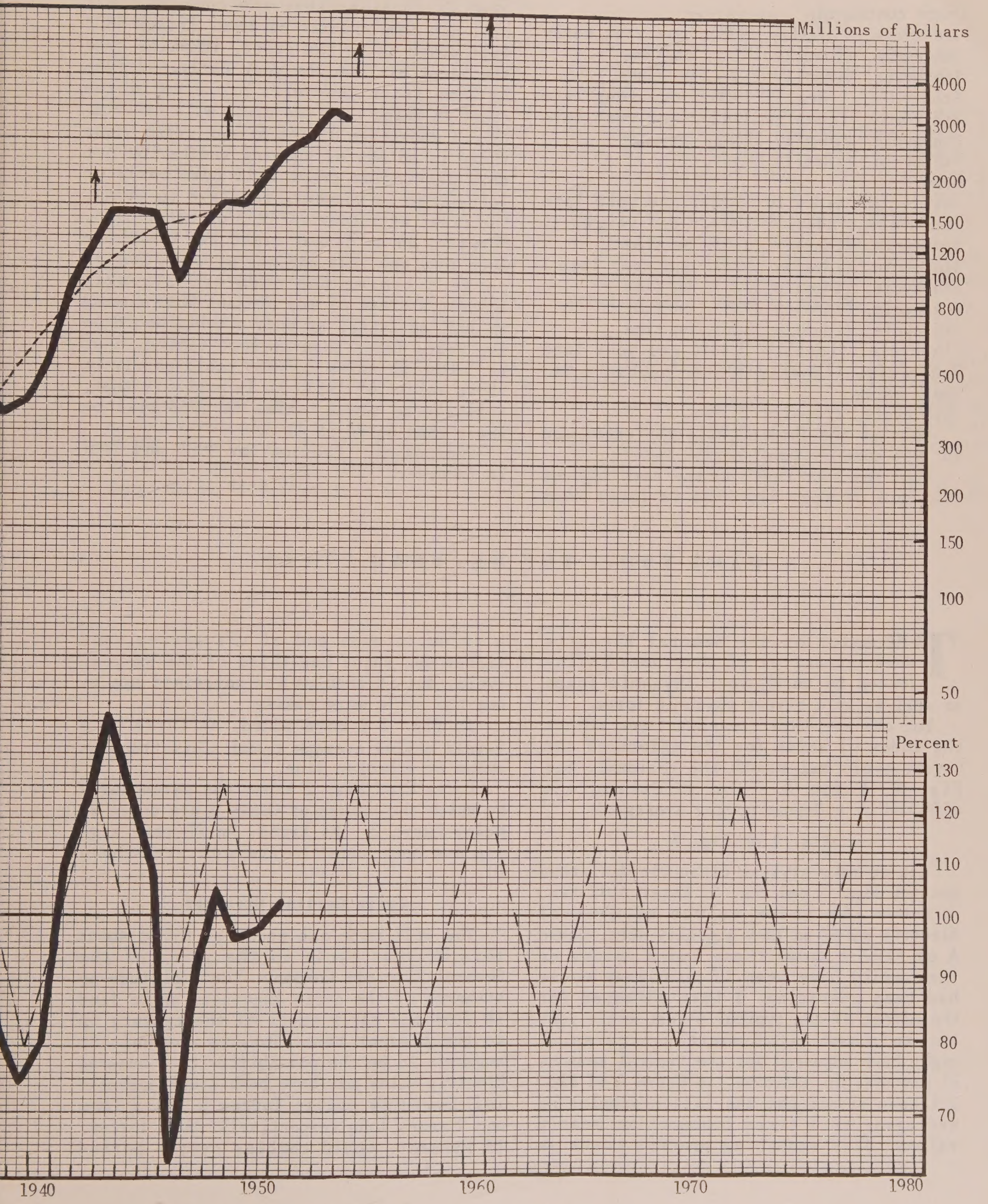


Fig. I. Index of General Electric Sales, 1899—1954
Curve A. Actual Index
Curve B. 7-Year Moving Average Trend
Curve C. Percentages by which Index is Above or Below Trend
Curve D. Regular 6-Year Cycle


Millions of Dollars
4000
3000
2000
1500
1200
1000
800
500
300
200
150
100
50
Percent
130
120
110
100
90
80
70
1940
1950
1960
1970
1980

Highs continued:
3rd cycle, (ideally 1918), one year early
4th cycle, (ideally 1924), on time
5th cycle, (ideally 1930), on time
6th cycle, (ideally 1936), one year late
7th cycle, (ideally 1942), one year late
8th cycle, (ideally 1948), on time
9th cycle, (ideally 1954), ?
Lows:
1st cycle, (ideally 1903), one year late
2nd cycle, (ideally 1909), one year early
3rd cycle, (ideally 1915), on time
4th cycle, (ideally 1921), one year late
5th cycle, (ideally 1927), on time
6th cycle, (ideally 1933), on time
7th cycle, (ideally 1939), on time
8th cycle, (ideally 1945), one year late
9th cycle, (ideally 1951), probably two years early
10th cycle, (ideally 1957), ?

What of the future? Will the crest due in 1954 come on time? Early? Late?

From the fact that, in the real figures (Curve A of Fig. 1), 1954 is lower than 1953 it is clear that the current crest will not come exactly on time. Either 1953 will prove to be the crest, in which case the crest will be one year early, or 1955 or some later year will prove to be the crest in which case the crest will be late. From a knowledge of the 6-year cycle alone there is no way of knowing whether or not this particular crest will come early or late—that is whether, relative to trend, the crest will come in 1953 or after 1954. However, as no 6-year crest has ever come more than one year one way or the other of perfect timing the odds are strongly against a crest of the present move coming in 1956 or later, as such a crest would be two years later than perfect timing. That is, although sales in 1955 could easily be above sales of 1953, it is probable that, relative to trend, sales in 1956 will be lower than sales in 1955.

Conclusion: Caution for 1956 and 1957 is in order.

PART TWO: THE 8½-YEAR CYCLE

THE sales of the General Electric Company act as if they were influenced by an 8½-year rhythmic force as well as by a 6-year rhythmic force.

You can see this clearly if you adjust the index of sales for the effect of the 6-year cycle and smooth the residual. See Fig. 2, Curve A. (The smoothing was effected by a 3-year moving average.)

Fig. 1 vs. Fig. 2

Let me make crystal clear the difference between Fig. 1 and Fig. 2. Curve A of Fig. 1 shows the index values of General Electric sales as they actually were. Curve A of Fig. 2 shows these index values as they would have been if no 6-year cycle had been operating. I have adjusted for the effect of the typical 6-year cycle just as, in a series of monthly figures, I might have adjusted for the typical seasonal pattern. In addition, in Curve A of Fig. 2 I have ironed out the little wiggles by averaging each three consecutive yearly values. This smoothing process costs us a value at each end of the series, and washes out about one-third of the 8½-year cycle, but it enables the untrained eye to see the cycle more easily.

In Fig. 2 I have added, as Curve B, a 9-year moving average trend. This trend is shown by a broken line.

Curve C of Fig. 2 shows the percentages by which the values of Curve A are above or below Curve B, the trend. An 8½-year zigzag has been added to aid your eye (Curve D).

Cycle Getting Stronger

You will note one peculiar thing about this 8½-year cycle in the sales of the General Electric Company: The amplitude or strength of the cycle increases as we find it from the early years of the century up to the present time. This is unusual. It suggests to me the possibility that General Electric sales may have been simultaneously influenced by cyclic forces 8 years long and 9 years long respectively. Such forces, if present, would combine over a period of time to look like an 8½-year cycle with gradually increasing strength.

If this is the true explanation, the 8½-year cycle will, in the course of time, get weaker. Eventually it will vanish. Then it will reappear, but upside down in relation to its present timing. I should emphasize that this is merely an idea. It is born of two facts. The first fact is that the 8½-year cycle acts the way it would act if it were caused in this way. The second fact is that eight and nine year cycles are very common, but 8½-year cycles are rather rare.

However, from the standpoint of forecasting sales in the immediate future, it is quite unimportant whether the 8½-year cycle is a simple 8½-year cycle or was caused by the interaction of cycles a little longer and a little shorter. In either event the resultant manifest cycle *is* 8½ years long. It should be projected as such, because we should always take facts as we find them.

The 8½-Year Cycle

The characteristics of the 8½-year cycle in the sales of the General Electric Company are as follows.

Typical time of crest: 1902.75 and every 8½ years thereafter. Current ideal time of high of typical 8½-year cycle, 1953.75.

Typical time of trough, 1907.0 and every 8½-years thereafter. Next ideal time of low of typical 8½-year cycle, 1958.0.

Typical shape of cycle; zigzag.

Typical strength of cycle: 118.3% of trend at ideal time of crest, 84.7% of trend at ideal time of trough.

Conclusion

I feel that this 8½-year cycle as well as the 6-year cycle, should be taken into account as a possible future tendency by those who wish to forecast the sales of the General Electric Company. Both suggest caution for 1956 and 1957.

E. R. D.

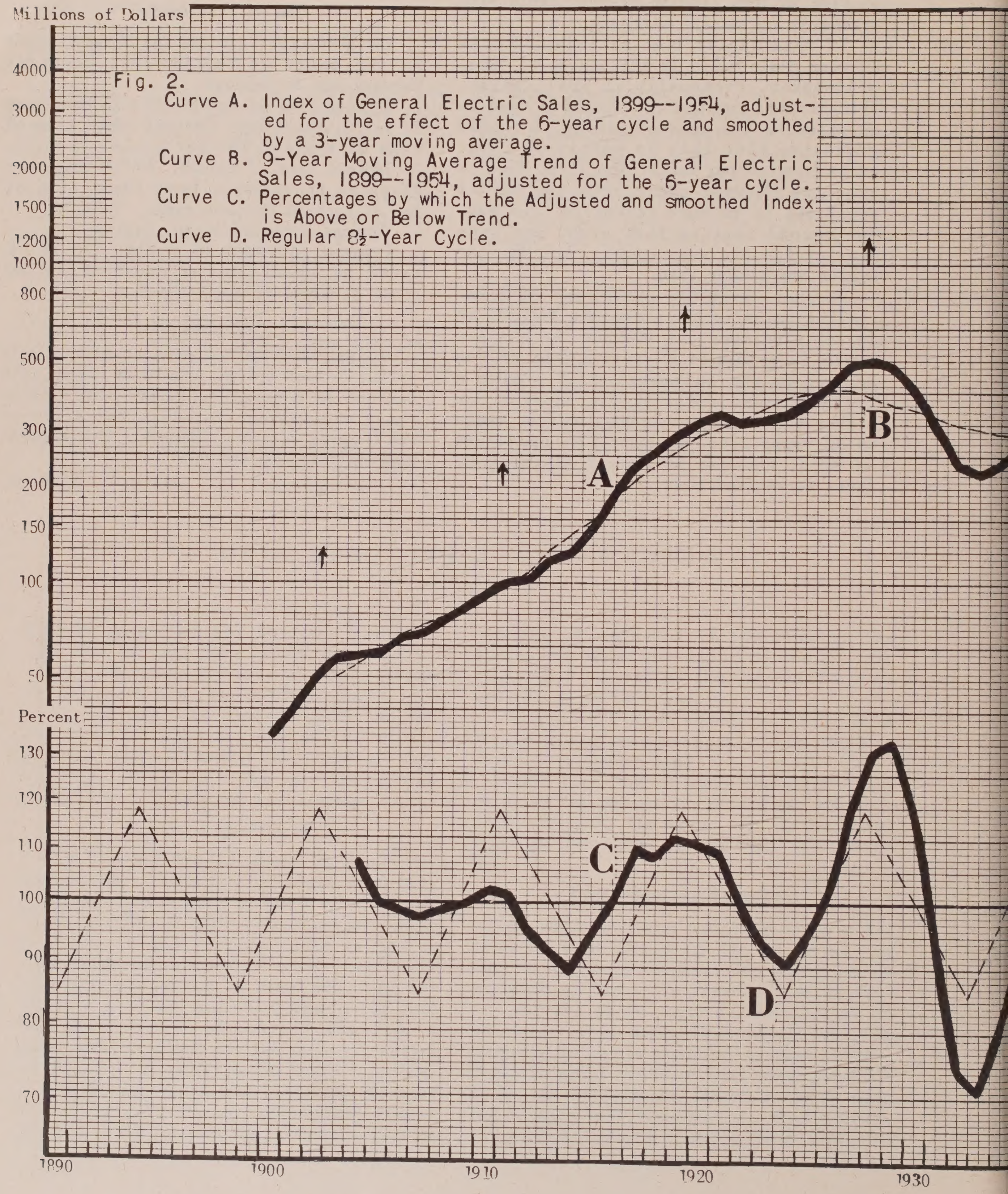


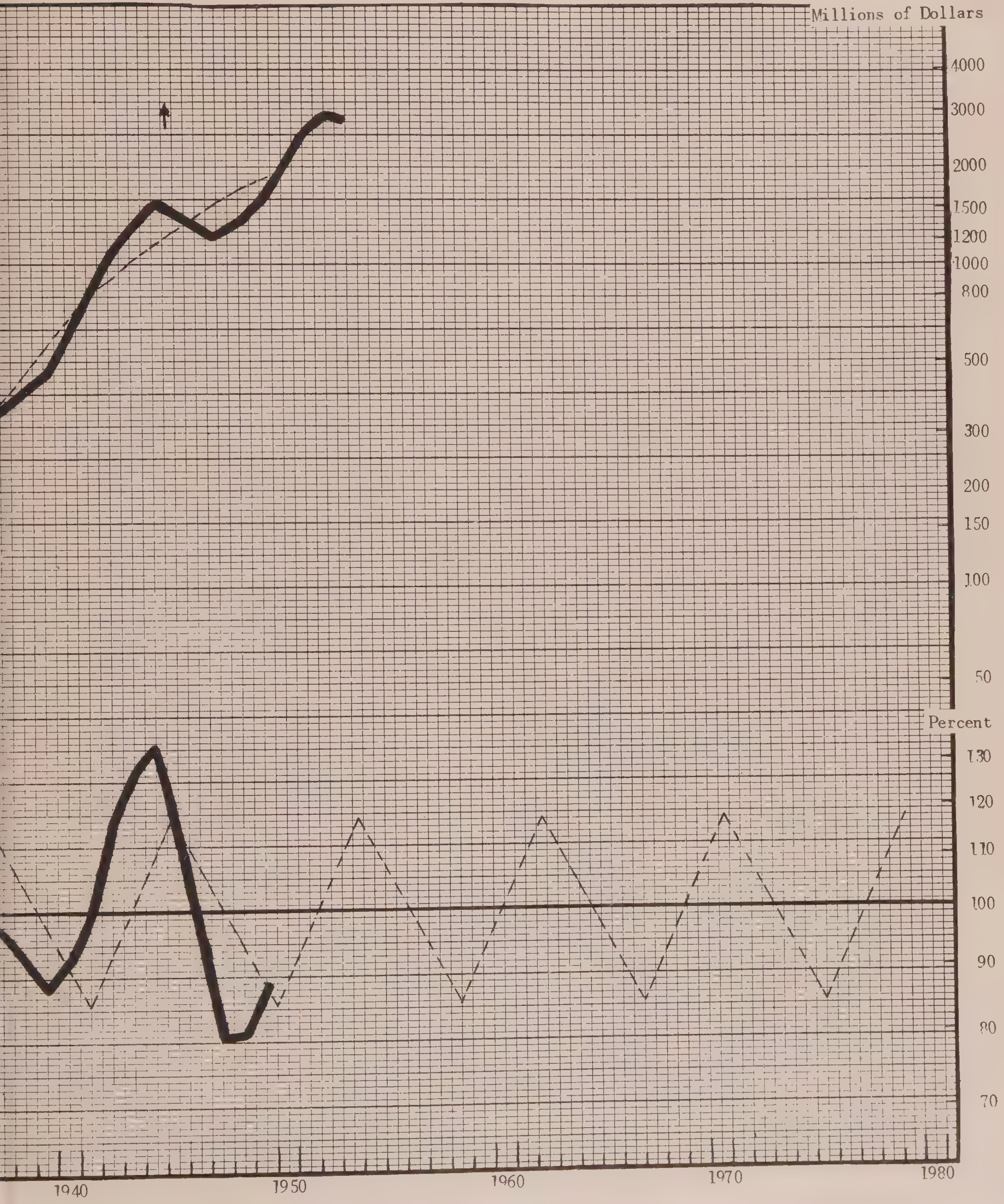
Fig. 2.

Curve A. Index of General Electric Sales, 1899--1954, adjusted for the effect of the 6-year cycle and smoothed by a 3-year moving average.

Curve B. 9-Year Moving Average Trend of General Electric Sales, 1899--1954, adjusted for the 6-year cycle.

Curve C. Percentages by which the Adjusted and smoothed Index is Above or Below Trend.

Curve D. Regular 8½-Year Cycle.


Millions of Dollars
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1950
1960
1970
1980

TABLE 1

GENERAL ELECTRIC COMPANY

Sales and Index of Sales, 1899-1954
In Millions of Dollars

YEAR	NOTES	PARENT COMPANY SALES	CONSOLIDATED SALES	INDEX OF SALES
1899	A	$ 22		$ 29
1900	A	29		38
1901	B	32		42
1902	B, C	37		49
1903	B, C	42		56
1904	C	39		52
1905	C	43		57
1906	C	60		80
1907	C	71		94
1908	C	45		60
1909	D	52		75
1910	E	71		94
1911	E	70		93
1912	E, F	89		118
1913	E, G	106		140
1914	G	90		119
1915	G	86		114
1916	G	134		178
1917	G	197		261
1918	G, H	217		288
1919	H	230		305
1920	H	276		366
1921	H	221		293
1922	H	200		265
1923	H	271		359
1924	H	299		396
1925	H	290		384
1926	H	327		433
1927	H	313		415
1928	H	337		447
1929	H	415		550
1930	H	376		498
1931	H	263		348
1932	H, I	147		195
1933	H, I	137		182
1934	H, I	165		219
1935	H, I	209	277	277
1936	H, I	269	354	354
1937	H, I	350	468	468
1938	H	259	359	359
1939	H	305	396	396
1940	H	412	524	524
1941	H	679	845	845
1942	H	1,047	1,171	1,171
1943	H		1,534	1,534
1944	H		1,534	1,534
1945	H		1,466	1,466
1946	H		911	911
1947	H, K		1,331	1,331
1948	K		1,633	1,633
1949	K		1,614	1,614
1950	K		1,960	1,960
1951	K		2,319	2,319
1952	K		2,624	2,624
1953	K		3,128	3,128
1954	K		2,959	2,959

A. SALES FOR YEAR ENDING THE FOLLOWING JANUARY 31ST.
B. INCOME ACCOUNT FOR YEAR ENDING THE FOLLOWING JANUARY 31ST.
C. SALES BILLED FOR YEAR ENDING THE FOLLOWING JANUARY 31ST.
D. ELEVEN MONTHS ONLY (FEB.-DEC., INC.)
E. SALES BILLED (ALL FIGURES FROM 1910 FORWARD FOR YEAR ENDING DEC. 31ST.)
F. INCLUDING PROFIT ON SECURITIES SOLD.
G. GROSS REVENUES
H. NET SALES BILLED
I. PARENT COMPANY SALES INCLUDE SALES TO AFFILIATED COMPANIES
1932 AND 1933 NOT STATED; 1934, $33; 1935, $42,
1936, $55; 1937, $61.
J. NET SALES BILLED.
K. NET BILLING.

CYCLES IN CRIME*

by
J. EDGAR HOOVER

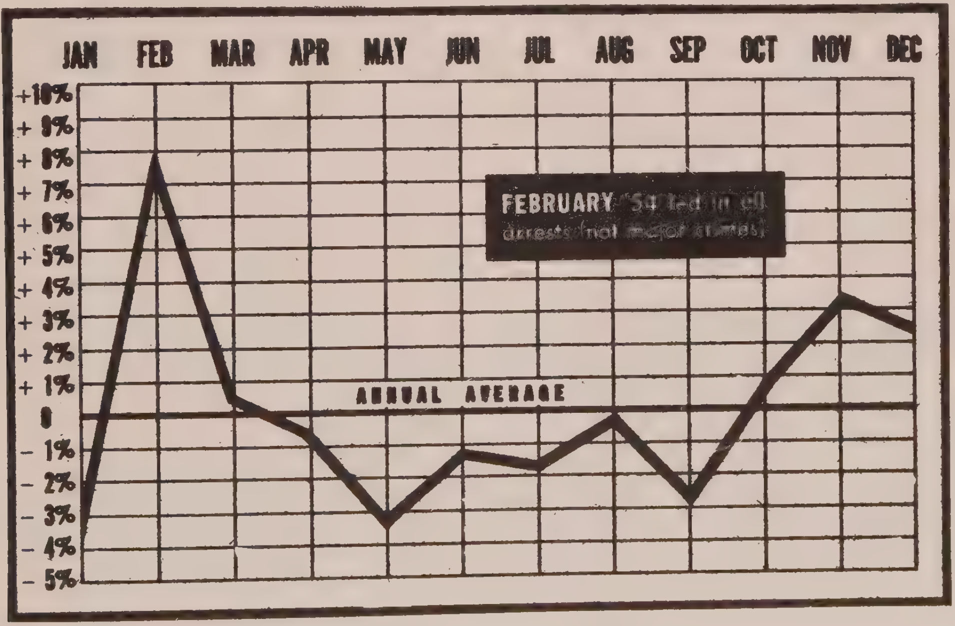
DOES crime vary with the seasons? Years ago criminologists might have dismissed your question as smacking too much of folklore and superstition. Today, however, it seems both pertinent and scientific.

Recent studies show a remarkable connection between seasonal changes and crime patterns. These trends can actually be graphed like business cycles. To a limited extent, meteorologists can predict rape as well as hurricanes. Police records, tabulated for five years in over 2,400 urban centers, reveal a clear rise and fall of criminal activity based on the calandar. The charts on this and the following pages are drawn from these records. The patterns have varied so slightly from year to year that fairly reliable forecasts can be made.

By watching these "weather vanes" of crime, an alert constabulary can shift its defense to block the crime-of-the-month. They can also forewarn the law-abiding citizen against whatever felony happens to be "in style" or "in the air" at the moment.

It might be enlightening for everyone to take a trip around the calendar. You'll be reading these words, for instance, in May. Whoever described it as "the merry month of May" knew what he was talking about for crime seems to have chosen it to take a holiday. Not that we aren't harried by the usual assortment of law violations. But only one menace actually reaches its peak this month. That's the chance of being bitten by a dog.

It has generally been taken for granted



FEBRUARY '54 led in all arrests (not major crimes)

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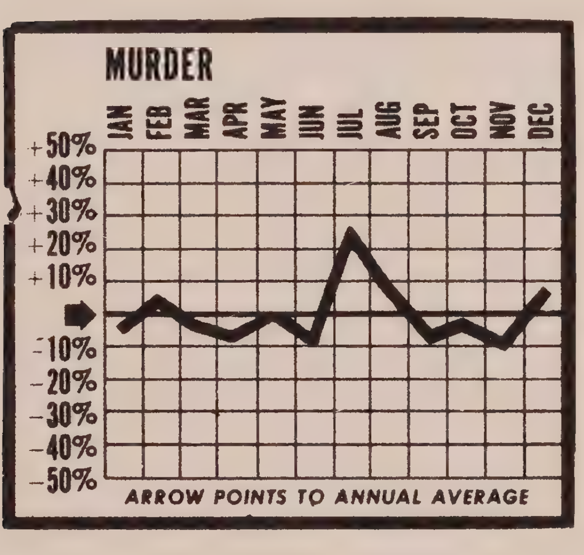
that dogs become most vicious during the sultry "dog days" of July and August. Police files, though, show there are more dog bites in May than any other month, and more in April than August. Why in spring a young dog's fancy turns to biting people is a mystery.

In terms of total crime, however, May, like January, is a rare oasis. Murders, for instance, are most likely to happen during August and September. As a matter of fact, the blazing sun brings out the year's worst rash of wilful offenses against the person. These include rape and deeds of passion in which people may be killed or crippled, not for money or property but for no logical reason at all. The number of aggravated assults—beatings, cuttings, stabbings which do not cause the victim to die—also climb with the thermometer.



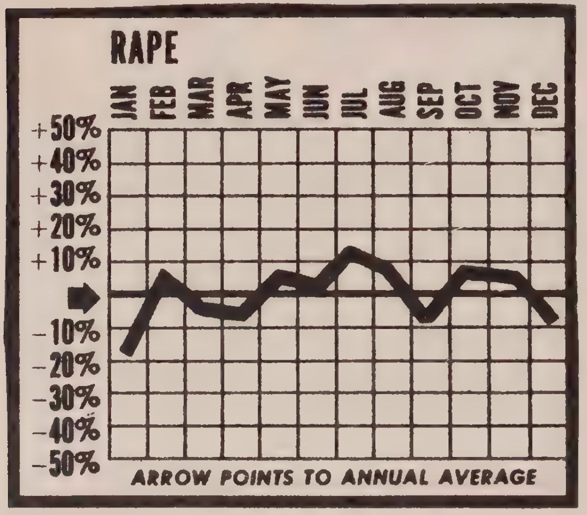
Frayed Tempers

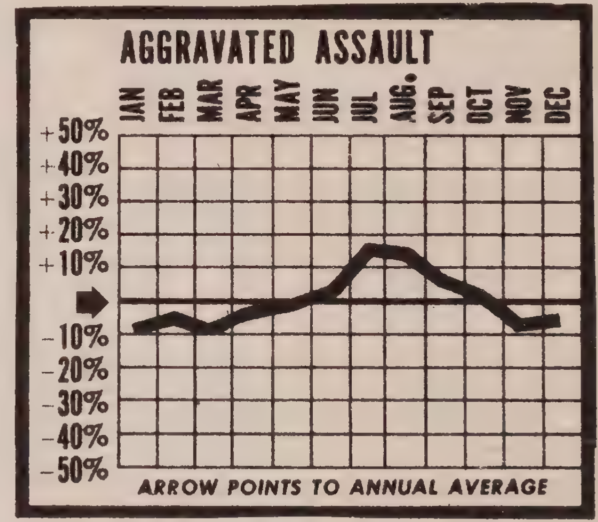
There is, of course, no proof of a correlation between humidity and homicide. Why murder's high tide should come in summertime we frankly don't know. Tempers, frayed by the heat, could account for part of it. But if that were all, then our problem could be solved by air-conditioning, not exactly a law-enforcement approach.

Not only is murder seasonal, it is even choosy for particular days. According to police studies, murder is largely a weekend crime. Most of them are bunched on Friday, Saturday, and Sunday. Obviously, these are the "social" days when congregating friends invite trouble as well as pleasure.

Most murders happen at night. Shakespeare struck a scientific as well as poetic note when he wrote: 'For I must talk of murders, rapes, and massacres, Acts of black night, abominable deeds."

Sixty-two out of every 100 murders are perpetrated between the hours of 6 p.m. and 6 a.m. One doesn't have to be a Sherlock Holmes to appreciate how a cloak of darkness abets the assassin.



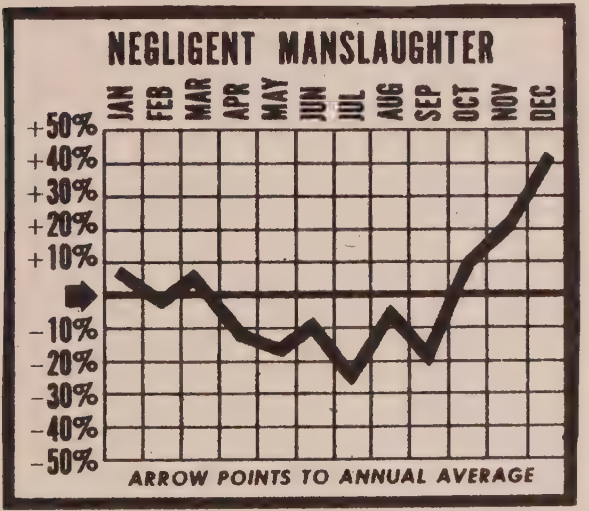


What makes one person take another's life? The heads of two large Midwestern police departments have reported their studies along these lines: Of 100 murders, 74 arose from domestic strife, lovers' quarrels (jealousy) and the eternal triangle.

Rape, another in the vicious assault classification, also flares higher as the warm summer months progress. The number of July and August cases far exceeds the norm, and police records show that Saturday and Sunday are the worst days. For some inexplicable reason, Thursday is the quietest for rapists, accounting for only 10 out of each 100. Sunday leads the week with an average of 19 of each 100.

The Longer, Blacker Nights

As we drift into winter, one's chance of being the victim of some form of negligent manslaughter increases. A classical example of this is being shot by a hunter who mistakes you for a deer. Much more serious, however, is the great winter risk of being snuffed out by negligent automobile drivers. This despite the fact that summer, with its jammed roads and collision-studded week ends, would seem to be much more accident prone.



But negligent manslaughter, usually committed by otherwise law-abiding citizens, follows a different seasonal graph from crimes of purposeful assault. Unfavorable driving conditions, and longer, blacker nights explain the higher traffic killings of winter.

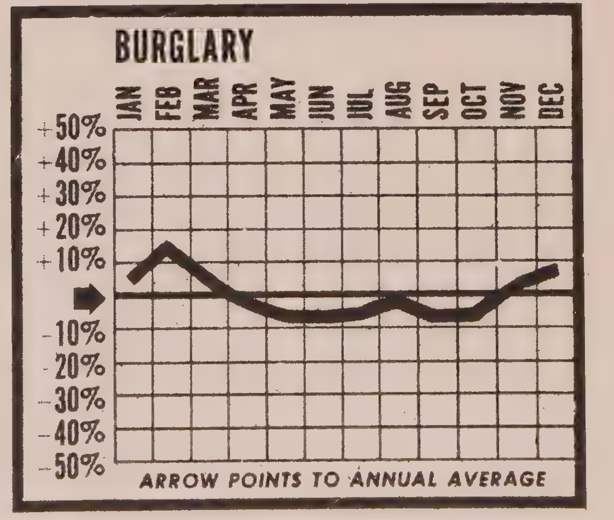
In 1953, for example, the number of traffic deathes due to negligent manslaughter was around 16 per cent below the annual average for the weather-clear, road-dry months of July and August. But they skyrocketed to almost 50 per cent above normal in the skiddy, ceiling-zero month of December.

No doubt much of this highway trouble springs from the seasonal spurt in Christmas-New Year's drunken drivers.

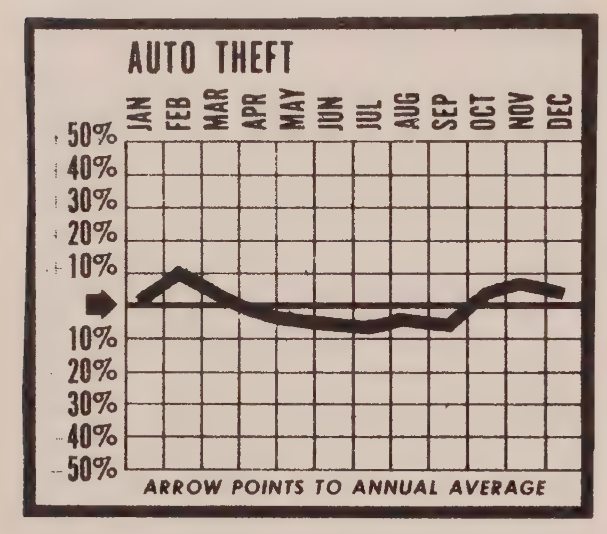
Burglary and robbery are also cold-weather perennials. For these crimes thrive on stealth. The forays of the lowly "common thief" are no laughing matter. They total up to $99,000,000 a year.

December for Robberies

Both burglars and robbers are inveterate calendar and clock-watchers. Police dockets disclose that 73 of each 100 robberies occur at night and that the citizen is most likely to be robbed between the hours of 6 p.m. and 2 a.m. in a Saturday night in December, January, or February. There are approximately 182 robberies in the peak month of December for each 100 in the low month of June.



Pocket-picking and shoplifting also reach their zenith in December. Their sudden dip in January indicates that the



crime magnet here is not long, black nights but crowded department stores. Both the pickpocket and the shoplifter operate on a Christmas premise that it is more blessed to receive than to give.

Although auto thefts occur more often during the cold months, accessory thieves are most active in February, March and April. This has nothing to do with March winds or April showers. It's just that car parts are more valuable right after the new models appear on the market. Accessory thieves are practically moribund in December.

Certain crimes occasionally take a holiday, but there's no rest for the FBI and the lawenforcing agencies. In a way I'm glad this article appears in May: it's the one month we wish could last all year.

THE 9-YEAR CYCLE
IN
NUMBER OF CATTLE ON FARMS
1867—1954

Summary

The number of all cattle on farms varies importantly, but not according to any fixed rhythm except for a very minor 9-year cycle. The 9-year cycle accounts for fluctuations of about two and one half percent above and below what the number otherwise would be.

The major oscillations are behaving in a way to suggest that the number of all cattle on farms will decline importantly over the course of the next several years.

ON the face of it, the number of cattle on farms has no regular cycle. The numbers go up and down in marked oscillations, but these oscillations are not regular enough to suggest a dominant cyclic force of any particular wave length.

From about 1890 to 1934, a span of 44 years, we have three reasonably regular waves which average a shade less than 15 years long. This is reminiscent of the 15.1-year cycle in the wholesale price of black pepper, present from 1820 to date.

However the number of cattle on farms did not continue this 15-year cycle, either forward from 1934 or backward from 1890. From 1934 forward the cycle has been about ten years long. From 1890 backward there seems to be no cycle at all, or, if there is, it is very faint indeed.

Probably the 15-year cycles from 1890 to 1934 and the 10-year cycles from 1934 to 1954 are mere oscillations, of no particular rhythmic significance.

What's Ahead

Even so they are of some practical usefulness. For the last four cycles the period of increasing numbers has ranged between seven and nine years. Under the circumstances 1954 or possibly 1955 should mark the end of the increase in numbers. If history repeats itself the next several years should show a down trend; but with cycles as irregular as those evidenced by cattle numbers, there is no way at this time of throwing any precise light on the probable date of the next low, except perhaps to say that it is not likely to come before 1959 nor after 1964.

There are of course statistical methods of knowing a year or two in advance when the crest or trough is approaching. These methods depend upon the fact that the tops and bottoms of the number of cattle curve turn over slowly. When the rate of increase or decrease diminishes it is a sign that the actual turning point is not far away. However, this is getting a little bit away from the subject of cycles.

A 9-Year Rhythmic Cycle Present

More powerful methods of analysis show that there is indeed a cycle in these figures. However it is so faint that you cannot see it by inspection. Before you can see it you need to use a statistical magnifying glass, as it were. Such a "magnifying glass" will filter out the more dominant 10- and 15-year random oscillations spoken of above so that the real rhythmic cycle becomes visible.

The real cycle turns out to be 9 years long. It has the following characteristics:

It crests ideally at 1872 and every 9 years thereafter. This puts the current crest ideally at 1953, the coming trough ideally 4 1/2 years later, because the cycle is symmetrical.

The 9-year cycle in the number of cattle on farms has a strength of 102.4% of trend at crest, 97.6% of trend at

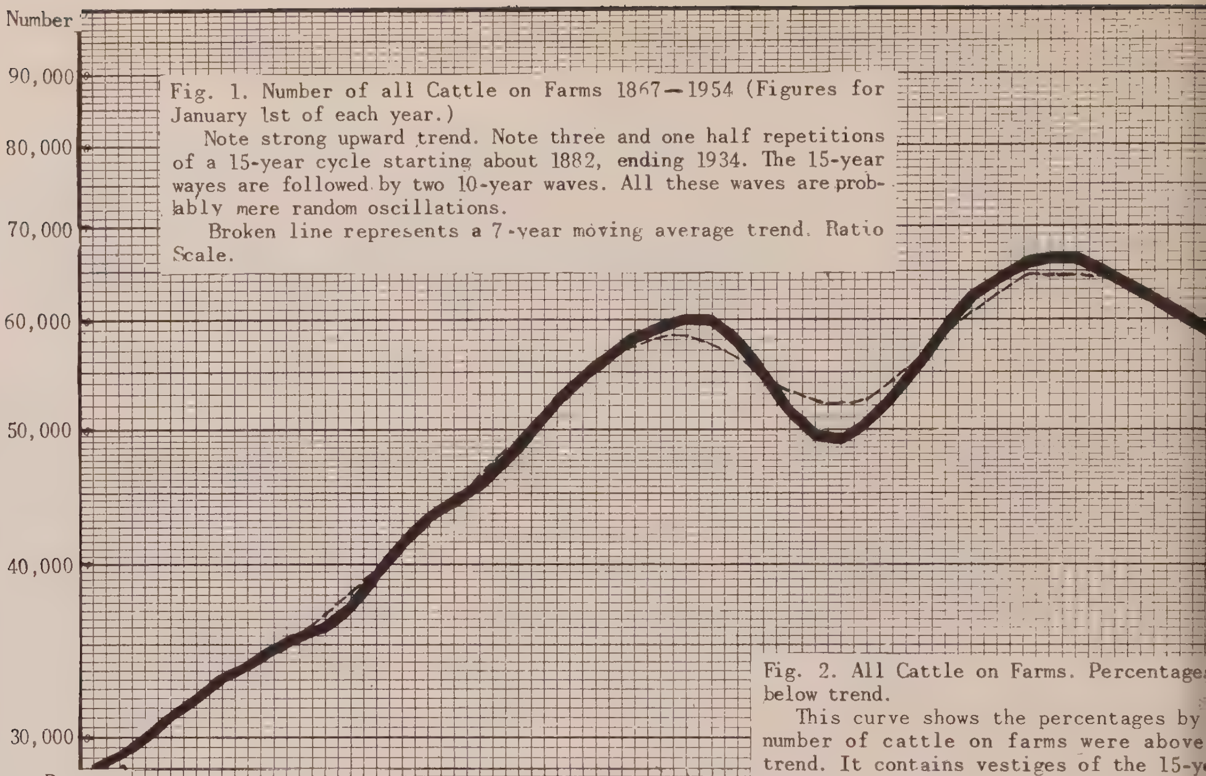


Fig. 1. Number of all Cattle on Farms 1867—1954 (Figures for January 1st of each year.)

Note strong upward trend. Note three and one half repetitions of a 15-year cycle starting about 1882, ending 1934. The 15-year waves are followed by two 10-year waves. All these waves are probably mere random oscillations.

Broken line represents a 7-year moving average trend. Ratio Scale.

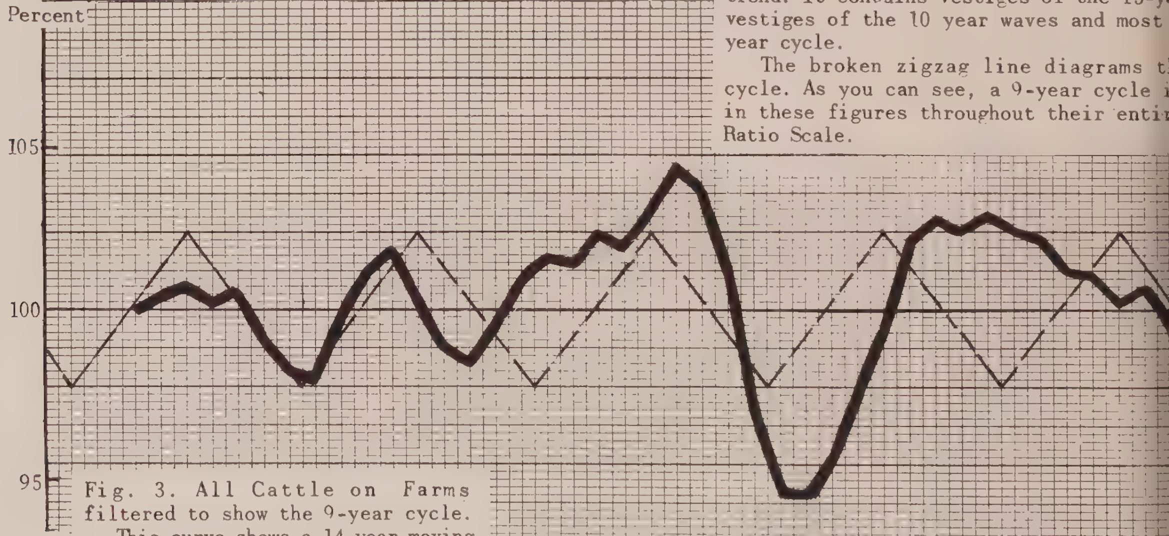


Fig. 2. All Cattle on Farms. Percentage
below trend.
This curve shows the percentages by
number of cattle on farms were above
trend. It contains vestiges of the 15-y
vestiges of the 10 year waves and most
year cycle.
The broken zigzag line diagrams t
cycle. As you can see, a 9-year cycle i
in these figures throughout their enti
Ratio Scale.

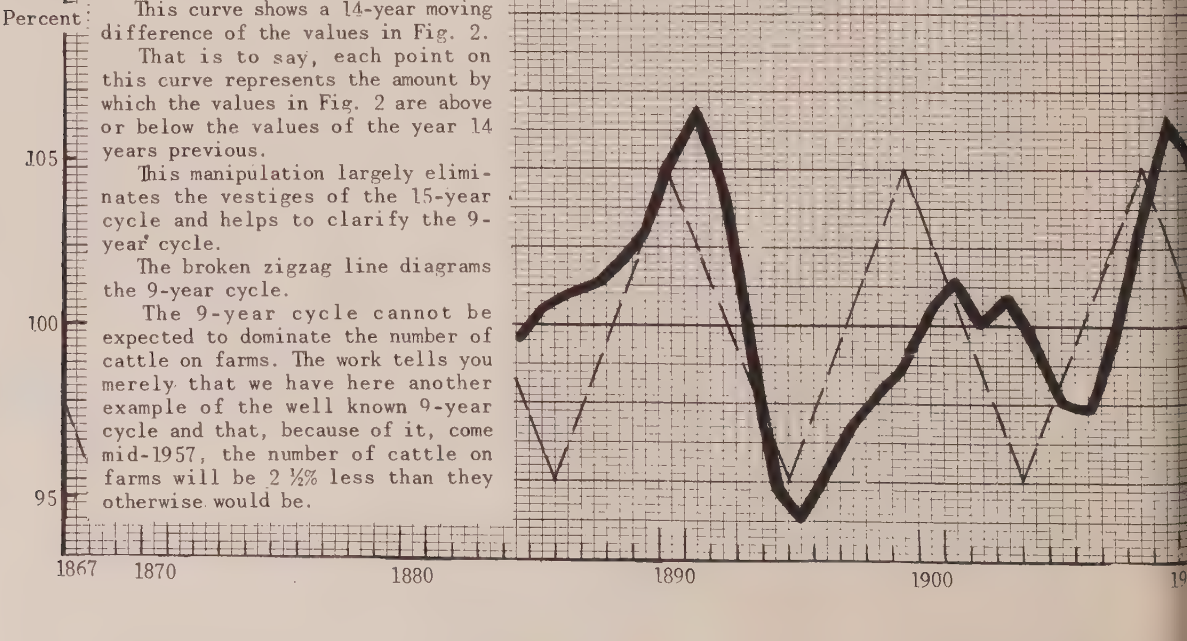


Fig. 3. All Cattle on Farms filtered to show the 9-year cycle.

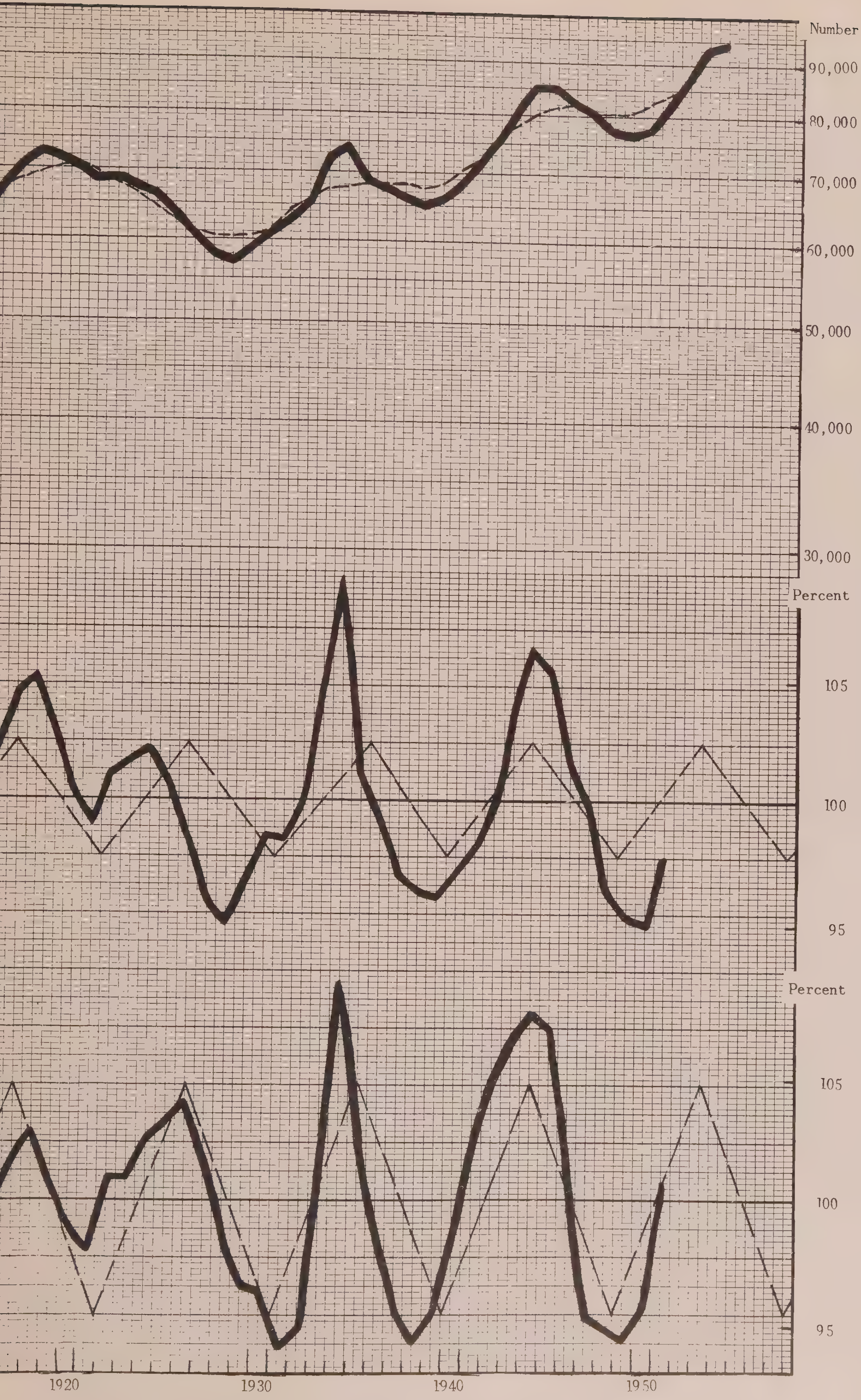
This curve shows a 14-year moving difference of the values in Fig. 2.

That is to say, each point on this curve represents the amount by which the values in Fig. 2 are above or below the values of the year 14 years previous.

This manipulation largely eliminates the vestiges of the 15-year cycle and helps to clarify the 9-year cycle.

The broken zigzag line diagrams the 9-year cycle.

The 9-year cycle cannot be expected to dominate the number of cattle on farms. The work tells you merely that we have here another example of the well known 9-year cycle and that, because of it, come mid-1957, the number of cattle on farms will be 2 ½% less than they otherwise would be.


Number
90,000
80,000
70,000
60,000
50,000
40,000
30,000
Percent
105
100
95
Percent
105
100
95
1920
1930
1940
1950

trough. It has rounded tops and bottoms.

As indicated above this cycle is not strong enough to dominate the ups and downs of the number of cattle on farms. The number of cattle on farms will undoubtedly continue to oscillate in major swings of irregular length. In the future as in the past it will probably be impossible to see the 9-year cycle except when separated out by statistical analysis.

Technical

Even though the 9-year cycle in the number of cattle on farms is of small practical utility, it is important from the standpoint of cycle study to record another example of the well known 9-year rhythm. Also it may be of interest to our technically minded readers to know how one can find and separate out a 9-year rhythmic cycle which is absolutely invisible in the actual figures.

The first thing to do is to get rid of the 15-year cycle without destroying a cycle of shorter length. The 15-year cycle can be eliminated and the 9- or 10-year cycle retained by computing and charting a 15-year moving difference of the original data. The 15-year moving difference is merely a series of figures which shows the amount by which the value for each year is above or below the value of the year 15 years previous.

This manipulation clearly shows that the shorter cycle is rhythmic (repeats time after time with a beat) and that it is 9 years long. (Curve not shown.)

To make the results even more plainly visible to you I expressed the values of cattle on farms as percentages of their 7-year moving average trend. See Fig. 2. These percentage deviations give us a head start toward seeing the 9-year cycle by eliminating 8/15 of the 15-year cycle and 3/10 of the spurious 10-year cycle but only 2/9 of the real 9-year cycle. The 9-year cycle emerges quite clearly and is diagrammed by a broken zigzag line.

The 9-year cycle can be still further clarified by computing the 14-year moving difference of the deviations charted in Fig. 2. Such a moving difference eliminates practically all of the vestiges of the 15-year cycle and emphasizes any 9-year cycle that might be present in the figures. It is plotted in Fig. 3.

Conclusion

Simple techniques reveal a 9-year cycle invisible to mere inspection. The 9-year cycle seems to be significant. It will probably continue.

This study adds to the number of things we know about which evidence a 9-year cycle.

E.R.D.

How it Came Out

A 1949 FORECAST OF RAYON PRODUCTION

EARLY in 1949 I made a study of the cycles in viscose rayon filament yarn production. This report was published at the time as Foundation Report No. 1. It originally sold at $100 a copy. Because that report shows you just how a cycle analysis is made, *complete with all the arithmetic*, it was reprinted in full in *Cycles* for February 1953. (Copies of this issue are still available at $1.00 each. If you are interested in the techniques of cycle analysis or in rayon you should buy a copy.)

The actual production of viscose rayon filament yarn 1911-1954 is charted in Fig. 1 on the next page. The values that have unfolded since the study was made (the six years since 1948) are shown by a bold line.

Four Cycles Discovered

The report of 1949 announced the discovery of four cycles in the production of viscose rayon filament yarn, viz., cycles 2 years, 2 3/4 years, 3 1/2 years, and 6 years in length.

These cycles appeared to be of uniform length and amplitude from the beginning of this series in 1911 up to World War II. The cycles continued during and immediately after World War II but at reduced strength. In 1949 they reverted to pre-war strength. A diagram of these cycles illustrating these facts is shown as Fig. 2. Fig. 2 also shows a synthesis or combination of these four cycles. Fig. 2 projects the cycles and their synthesis to 1960 on the pre-war basis. (By the end of 1949 it was clear that the cycles had reverted to their pre-war strength.)

The basic underlying growth trend is shown in Fig. 3. You will note that growth is shown in three stages. This may be the result of two "rebirths" or may be the result of a cycle about 22 years long.

Trend Flattening

In 1949 it was clear that trend was flattening rapidly. As the report says, 'the underlying growth trend, after showing average growth of 12 percent from 1939 to 1945, seems to have slackened to 10 percent from 1945 to 1946, 8 percent from 1946 to 1947, and 6 percent from 1947 to 1948." Projecting the trend on this basis through 1960 gives us the values shown in Fig. 3 Of course any projections of trend twelve years in advance is little more than a guess, but so far it seems to have worked out all right.

The Projection

The synthesis or combination of trend and cycles, 1911-1960 is shown in Fig. 1 by means of a broken line. Not only does this synthesis describe the behavior 1911-1948, but, except for 1950 and 1954, it has forecast the behavior 1949-1954 with great accuracy. The production in 1950 may have been disturbed by scare buying at the beginning of the Korean War. I do not know what disturbed behavior in 1954.

Fig. 4 shows the synthesis of trend and cycles on an enlarged scale, 1935-1960, and actual production, 1935-1954. The production after 1948 is shown by a bold line because these values were not known when the forecast was made. This curve shows how the forecast came out.

The report of 1949 projected the cycles

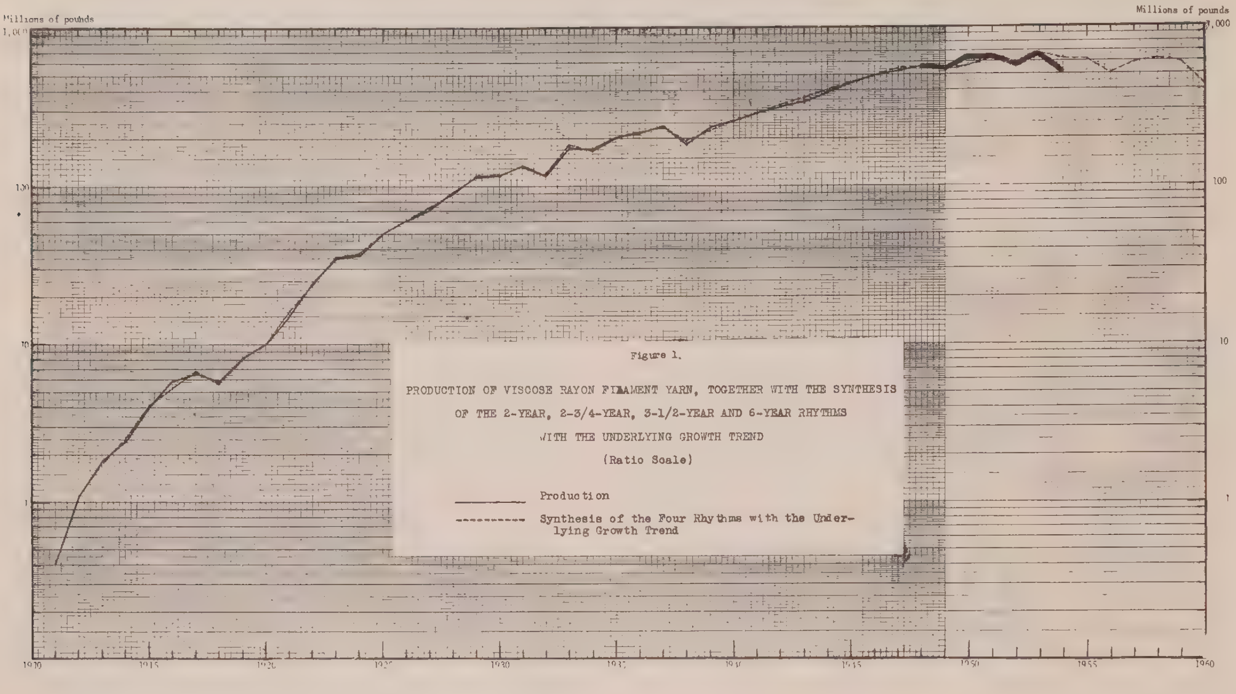


Figure 1.

PRODUCTION OF VISCOSE RAYON FILAMENT YARN, TOGETHER WITH THE SYNTHESIS OF THE 2-YEAR, 2-3/4-YEAR, 3-1/2-YEAR AND 6-YEAR RHYTHMS WITH THE UNDERLYING GROWTH TREND

(Ratio Scale)

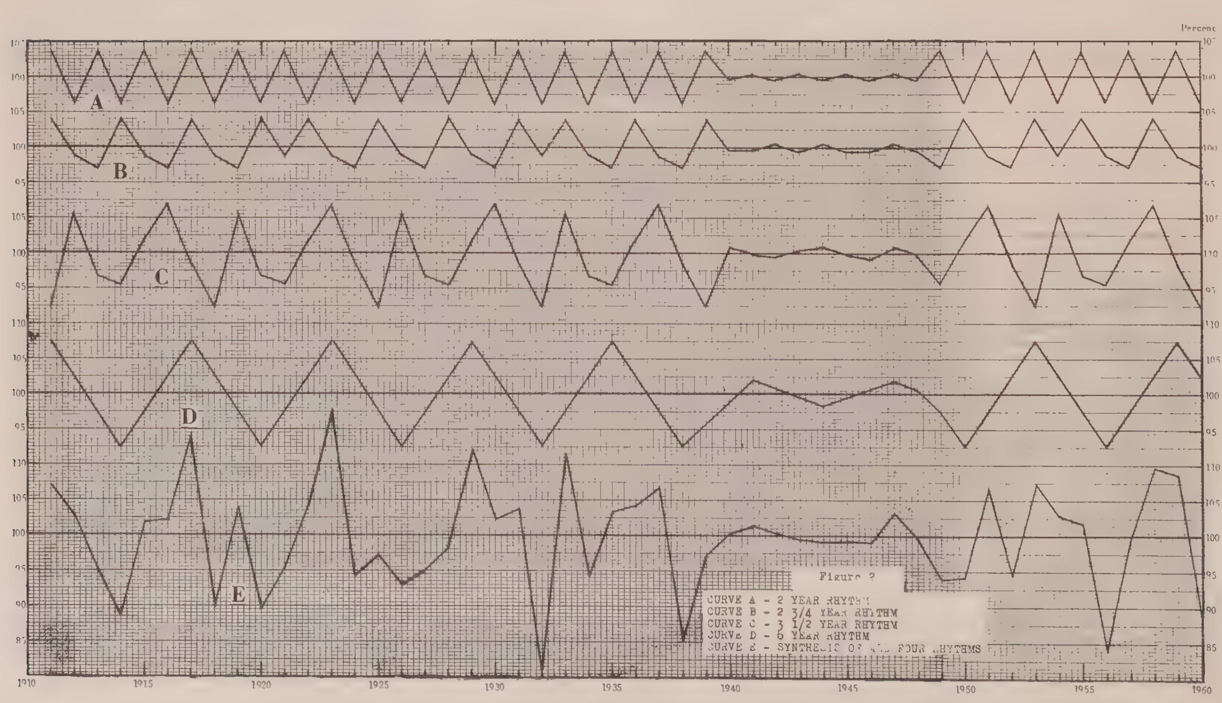


Figure 2

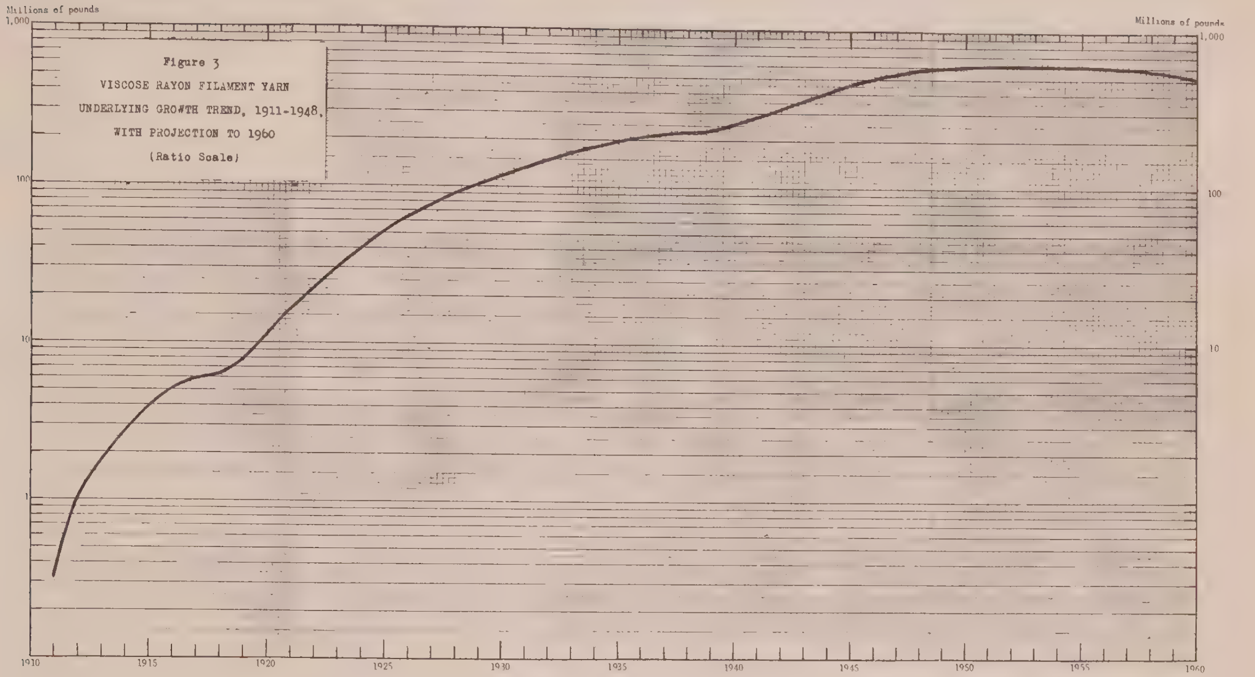


Figure 3
VISCOSE RAYON FILAMENT YARN
UNDERLYING GROWTH TREND, 1911-1948,
WITH PROJECTION TO 1960
(Ratio Scale)

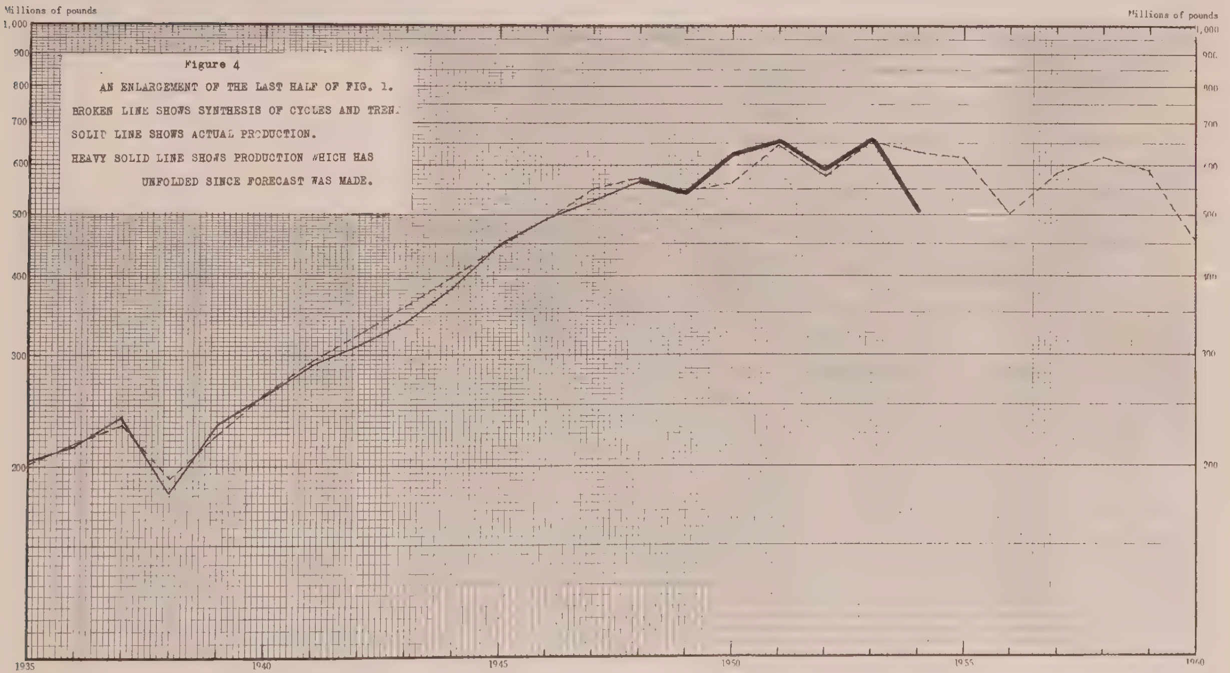


Figure 4
AN ENLARGEMENT OF THE LAST HALF OF FIG. 1.
BROKEN LINE SHOWS SYNTHESIS OF CYCLES AND TREND
SOLID LINE SHOWS ACTUAL PRODUCTION.
HEAVY SOLID LINE SHOWS PRODUCTION WHICH HAS
UNFOLDED SINCE FORECAST WAS MADE.

and their synthesis to 1949 on two bases, namely at war strength and at pre-war strength. This was done because until the end of 1949 it was not possible to know which way the cat was going to jump.

Additional Research Recommended

Although the report defined trend and projected the cycles, it was not intended to be used as a forecast. In fact the report said:

Anyone who wishes to use this information in a practical way should take the following steps:

1. Obtain monthly figures, 1911 to date.
2. Determine *exact length, shape, and phase* of the so-called 2-year rhythm (24 1/4 months?) both (a) pre-war and (b) war and post-war.
3. Do the same for what in this paper has been called the 2 3/4-year rhythm (32.85 months?).
4. Do the same for the so-called 3 1/2-year rhythm (41 months?).
5. Do the same for the so-called 6-year rhythm (70.9 months; or 73.3 months, or a combination of the two?).
6. In all of these determinations it will be helpful to work with the percentages that the actual data are of the tentative underlying growth trend, as reported here, converted to a monthly basis.
7. Adjust for all these rhythms.
8. Revise the underlying growth trend to take account of the more accurate wave length, wave shape, and timing determinations.
9. Revise estimates of the recent behavior of the underlying growth trend, and project it into the future taking all known factors into account.
10. In view of the increased importance of rayon tire cord, it would be well to make a study of the rhythms and trend in tire production. I do not know what they are, but I do know that the 6-year rhythm is very important in the factory sales of passenger cars.
11. A study should also be made of the rhythms and trend in the *sales* of viscose rayon filament yarn....

It is possible that the additional studies suggested would have given forewarning of the greater-than-originally-predicted decline of 1954.

Summary

A cycle forecast of viscose rayon filament yarn production made in 1949 correctly forecast the direction of actual production (up or down, compared with the year before) for every year from 1948 to date. In addition, in four out of six cases, it forecast the levels correctly within 3%.

E. R. D.

Letters

Coincidence?

Dear Mr. Dewey:

I am continuing my subscription to Cycles both because I read it with interest, and because you are clearly trying to do a worthwhile job. But I hope you will forgive me if I continue to doubt the real value of these studies.

When one suggests old-fashioned 'coincidence' as the origin for all sorts of recurrent phenomena, one is always answered with a horrified: "Gracious, - how could mere coincidence account for all these repeated, and re-repeated occasions?"

This answer ignores the monumental vastness of coincidence and its role as the ordinary source of history. In our universe with its billions of particles, what a number of coincidences there must be—any two items moving toward or away from each other, or at any tangent are each in thousands upon thousands of coincidental relationships with thousands upon thousands of others.

Each living thing, then, and each dead one too, is the sum of a series of coincidences, and so is all that happens or doesn't happen to him or her or it.

I have plunged along and (unexpectedly) written so much that perhaps you will forgive the addition of a short story, almost all of which is quite true.

In the Army some years ago, two men were assigned to our company, and they had identical (and rather odd) names—first, middle and last name all three a bit unusual and all three the same. And by a further unfortunate coincidence their serial numbers were very similar, something like 18613290 and 18612390.

They and their papers were always getting mixed up, and many earnest and helpful clerks spent troubled hours rubbing out the right numbers and putting in the wrong ones in what they believed was a helpful effort to get everything straightened out.

Luckily the two soldiers' characters were different; one finally went A.W.O.L., and so, seizing the golden chance, we threw the other in jail. This got rid of them both, and thereafter our paper work was as smooth as syrup.

I hope you liked the story, but perhaps you are wondering just what is the point. The point is that once we defied coincidence and took a direct and simple action, all our difficulties were over, and we could fight the war in peace.

Cordially yours,

Margate, N. J.

In Reply I Said:

Dear ....

I agree with you fully that many of the cycles we observe in natural and in social phenomena are the result of pure coincidence.

Cycles can be found even in random numbers as I have pointed out time and again. However, some of the cycles with which we deal are so regular and have repeated themselves so many times, that they cannot easily be the result of chance. To cap it, some of the cycles keep on coming true after discovery. It is very difficult for this sort of thing to happen in purely chance behavior.

I will freely confess that I know of no way to tell for certain the probable significance of any particular cycle. It is very important that we learn how to do this, I hope that some mathematical statistician will soon give us a simple and reliable way to obtain this answer. In the meantime our opinion must be based upon common sense, and, as you suggest, this may be fallible.

Ever cordially yours,

THE MODIFIED GEISINGER INDICATOR

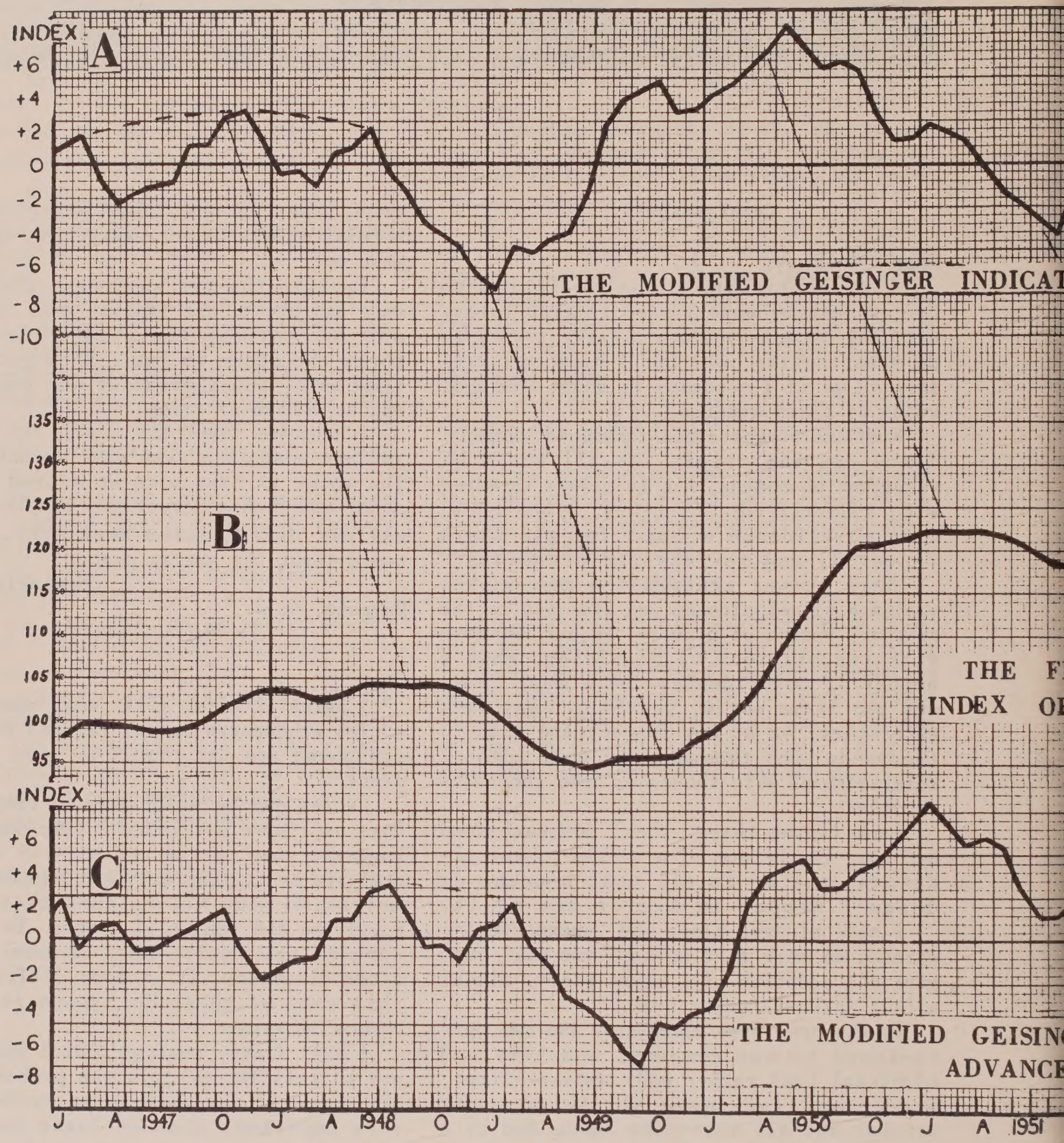
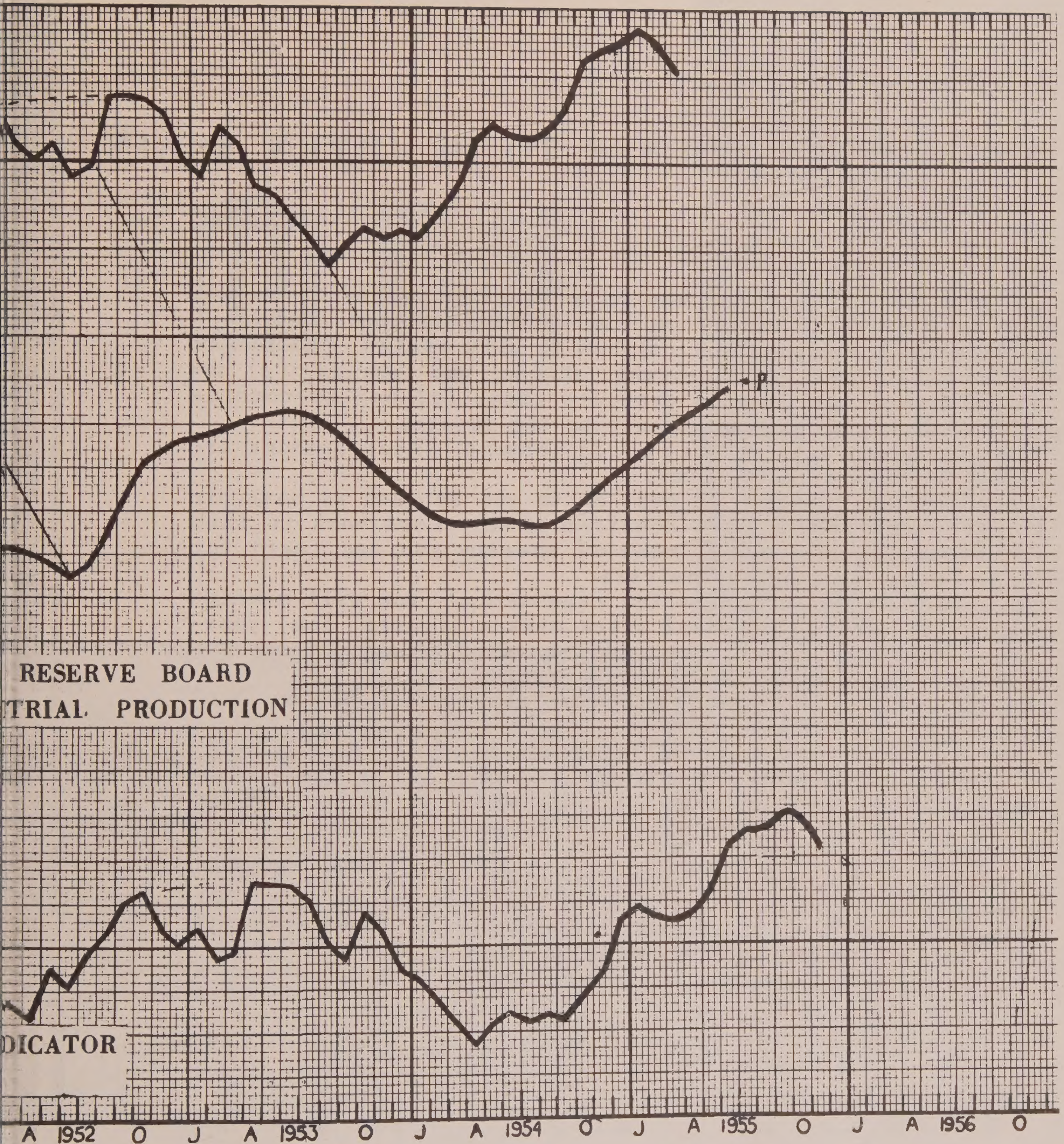


Fig. 1. Curve A. The Modified Geisinger Industrial Production Indicator Curve. This curve is derived from certain figures which are published monthly in the *Survey of Current Business*. It tends to turn about 8 months before the Federal Reserve Board Index of Industrial Production.

Curve B. The Federal Reserve Board Index of Industrial Production adjusted for seasonal variation and smoothed by a 3-month moving average. The value for the latest available month is shown by a dot.

Curve C. This Curve is the Modified Geisinger Industrial Production Indicator Curve advanced by 8 months. This process projects part of the curve into the future. If the relationships of the past continue, the projection gives some hint of what may happen to the Federal Reserve Board Index of Industrial Production (Curve B).

OF INDUSTRIAL PRODUCTION



THE FORECAST

The Modified Geisinger Indicator, which has been forecasting strength through the third quarter of 1955, has now turned down.

The values, projected forward by eight months, are 7.7 for September, 7.1 for October, and 5.4 for November.

These values are still very strong, and the turn down may be a false alarm. However the fact that a crest has occurred introduces a note of caution. A leveling of the Federal Reserve Index of Industrial Production in the 4th quarter of 1955 is suggested as a possibility.

E. R. D.

Mr. H. A. Musham
741 No. Rush St.
Chicago, Ill.

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In addition, you will analyze, under supervision, a series of figures of your own choosing.

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Send your application, check, and educational background to me. Make check payable to Foundation for the Study of Cycles.

E. R. Dewey,
Director,
East Brady, Pa.

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